XXVIII.—*The Systematic Value of the Glans Penis in Macaque Monkeys.* By R. I. Pocock, F.R.S.

In his paper on the anatomy of *Macacus brunneus* from Bhamo (Proc. Zool. Soc. 1872, pp. 203–212), Anderson described and figured (p. 209) the penis, but apparently without being aware of the interest of the facts he recorded.

The glans is represented as an exceedingly long narrow cone, gradually tapering distally, and nearly four times as long as its proximal width. It is covered with minute recurved spicules. The orifice is an elongated slit occupying the distal third of the lower side of the glans, and this side has a long angular excavation reaching from its proximal end, where it is widest, to the middle of the glans, where it is narrowest, the apex being separated from the proximal end of the urethral orifice by a narrow bridge of spicular epithelium. The proximal end of the glans is wider than the portion of the penis to which it is attached, and sharply marked off from it (fig. 1, H, G). Finally, the glans is strengthened by a baculum, which extends throughout its length and was described as curving downwards and forwards and to be exactly an inch long *.

Although the monkey described by Anderson was immature, it had cut all its permanent teeth except the last molars. It may be added that *brunneus* is regarded as a synonym of *arctoides*, Geoffr., the name by which the species was known until a few years ago. The correct title, however, appears to be *speciosus*, Cuv.

In 1919 the Zoological Society purchased an adult male example of *M. speciosus*, which was shipped from Calcutta, but was stated, no doubt correctly, to have come from Burma. It died in December 1920, thus giving me the opportunity to check Anderson's description of the penis.

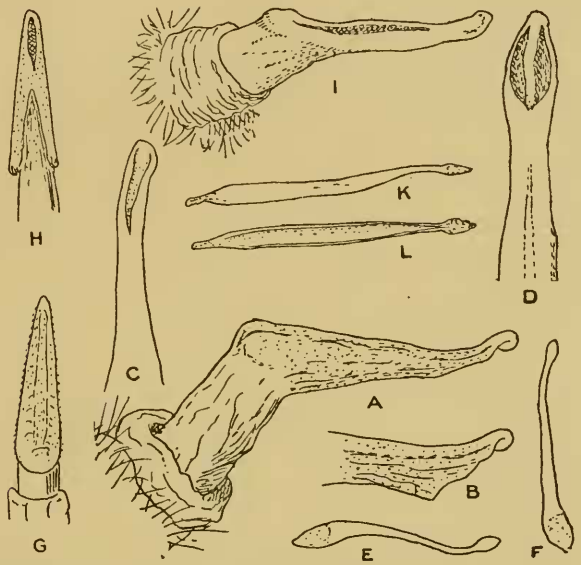
In most particulars this organ agrees tolerably closely with that of the specimen examined by Anderson, but there is no deep notch in the middle of the underside of the proximal half of the glans †. The glans is long, tapering, slightly upturned at the end, which is bent a little to the left. It is everywhere roughened with recurved spicules, and is capable of being bent on the basal portion of the penis at a considerable

* The woodcuts from which this description of the penis has been taken are indifferent figures.

† I can make no suggestion as to the significance of this discrepancy, unless two species are involved. In that case I do not know which, if either, should take the name *speciosus*.

angle or brought into the same line with it. Both the orifice and the urethral canal are capable of considerable dilatation, but in the rest of the penis the channel is a narrow cylindrical

Fig. 1.



A. Penis of *Lyssodes speciosus* withdrawn from prepuce, from the left side, the animal supine.
B. Distal half of glans of the same with urethral orifice spread.
C. Inferior aspect of glans of the same, showing the terminal slit-like orifice undistended.
D. The same with the orifice spread, the *baculum* in the middle line.
E. Lateral view of *baculum* extracted.
F. Ventral view of the same.
G. Dorsal view of glans of the specimen named *brunneus* by Anderson.
H. Ventral view of the same.
I. Lateral view of glans of *L. fuscatus.*
K. Lateral view of *baculum* of the same.
L. Ventral view of *baculum* of the same.

Figs. **A**–**F** are two-thirds natural size.
Figs. **H, G** are copied from Anderson.
Figs. **I**–**L** are copied from Murie.

tube. This portion of the penis is short as compared with the glans (fig. 1, A, B, C, D).

The baculum which is 42 mm. long instead of 25 mm. as recorded in his subadult example by Anderson, is subcircular

in section, although slightly compressed in its distal fourth except at the upturned * apex, which exhibits a small ovate thickening. The proximal end, where the bone becomes spongy, is much expanded, but between this expanded portion and the apex the shaft gradually narrows (fig. 1, E, F).

On pp. 784–785 of the volume of the Proc. Zool. Soc. containing Anderson's description of *M. brunneus*, Murie described the external male genitalia of the Japanese macaque which he named *Macacus speciosus*. The name now adopted is *M. fuscatus*, Blyth. I think we must assume, provisionally at all events, that Murie's identification was correct, although I do not know the history of the specimen he examined.

The *glans penis* itself appears to be shaped very much as in the Burmese species *M. speciosus*, being broad at the base, where it is bent at an angle on the proximal portion of the organ; from the base it tapers towards the apex, which is slightly upturned and slightly expanded; but, as Murie pointed out, its surface is quite smooth, and not spicular † (fig. 1, I).

Despite the similarities in the glans, the *bacula* of the two species are very different. That of the Japanese species is nearly straight, narrowed and pointed at its proximal end, lanceolate at its distal end, with its lower surface widely channelled. It is in this latter respect that it differs so markedly from the subcylindrical baculum of the Burmese form. The bone was 50 mm. long (fig. 1, K, L).

Curiously enough, neither Anderson nor Murie appears to have been particularly impressed by the peculiarities of the *glans penis* in these two species, nor aware that it differs profoundly from the glans in all the commoner species of macaques, such as *sinicus*, *irus* and its allies, *rhesus*, and

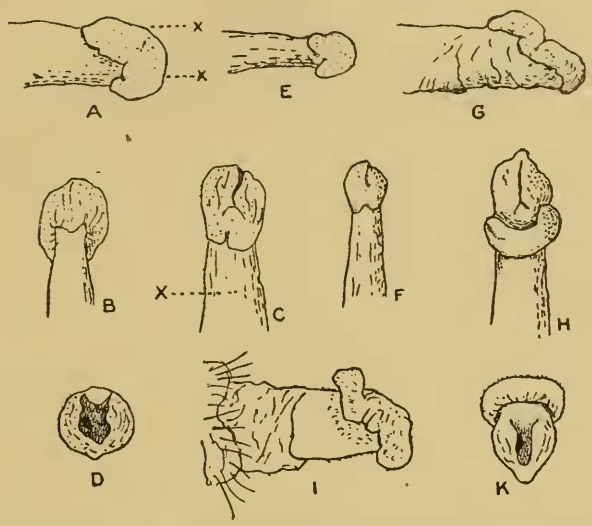
* Anderson described the baculum of his specimen as turned downwards at the apex. The description was probably drawn up after the bone had been cleaned for examination, and I suspect its upper and under surfaces were confused.

† On examining Murie's figure (p. 785) of the penis, I was at first inclined to think that the glans differs materially from that of the Burmese species in being bent upwards upon the proximal portion of the organ, with the thickening at the angle on the under side, instead of on the upper side as in the Burmese animal, and the apex turned slightly downwards instead of upwards. This was due to my interpreting the dark shading on the right-hand portion of the figure of the glans as representing a long slit-like urethral orifice extending from the proximal end of the glans over rather more than two-thirds of its length. In that case the orifice, both in position and length, would differ remarkably from that of the Burmese species. It would be unjust, however, to believe Murie capable of overlooking such a difference. Hence we must assume that his figure of the penis represents the right aspect of that organ, the upper side being above and the under side below. The shading, in question, is probably only a groove in the epithelium.

nemestrinus, although it is true that Murie states the baculum of the rhesus to be relatively solid and only half the size of that of the Japanese macaque.

In the species named the glans is much shorter than the

Fig. 2.



A. Glans penis of *Macaca nemestrina* from the side, ×, × marking the position and length of the labiate terminal orifice of the urethra.
B. The same from below.
C. The same from above, × marking the proximal end of the *baculum*.
D. The same from the front, with the labia of the terminal orifice dilated, showing the eccentric inner opening of the urethra.
E. Glans penis of *Macaca irus* from the side.
F. The same from above.
G. Glans penis of *Zati sinicus* from the side.
H. The same from above.
I. Penis, partially withdrawn, of *Z. sinicus*, another specimen.
K. Glans penis of same specimen from the front, with labia separated, to show eccentric orifice of urethral canal.

All figures two-thirds natural size. Drawings made from adult examples.

proximal portion of the penis, and, setting *sinicus* for a moment on one side, is bluntly rounded at the apex and forms an irregularly rounded or ovate, soft, cushion-like cap * to

* Quite appositely likened to a helmet by Retlever and Neuville, who described it in *M. fascicularis* and *rhesus* (C. R. Soc. Biol. Paris, lxxvii. p. 535, 1914).

the penis, with the orifice as a vertical terminal slit extending further on to the dorsal than the ventral side, and eccentric in the sense that it lies to the right of the middle line, being pushed as it were out of place by the end of the baculum, which is actually in the middle line alongside it. There is a wide and deep angular excision on each side of the glans and a much smaller one in the middle of its posterior border above. The surface is covered with small spicules (fig. 2, A–F). In a general way the glans of *Papio*, *Cercocebus*, *Cercopithecus*, and *Pithecus* (*Presbytis*) is like that described above; but in *M. sinicus* it is modified, although not in the direction leading to the specialization seen in *M. fuscatus* and *speciosus*. It is more coarsely spicular, slightly pointed at the apex, and hence regularly or irregularly piriform when seen from above; but the posterior portion of its upper side is developed into a transverse crescentic thickening with its concavity looking forwards (fig. 2, G–K).

In the foregoing paragraphs the species therein discussed have been referred to the genus *Macaca*; but the monkeys commonly called macaques are a heterogeneous mob divided by authors of the present time into a number of genera and subgenera which are based for the most part upon unsatisfactory characters of very little systematic value, such as the length of the tail, the arrangement of the hairs on the crown of the head, and so forth. Thus we have *Macaca* for *inuus* (the Barbary macaque), *Silenus* for *albibarbatus* (the wanderoo of textbooks), *Zati* for *sinicus* (the bonnet macaque), etc. These and other names, with their synonyms, may be found in Allen's paper (Bull. Amer. Mus. Nat. Hist. xxxv. pp. 49–51, 1916).

It is beyond my present purpose to discuss these genera and subgenera except in so far as the penis is concerned. Unfortunately I am only acquainted with that organ in comparatively a few forms. Hence a complete revision of the genus *Macaca*, in the widest sense of that name, is impossible. I think, however, that all systematists will agree in the impossibility of classifying *speciosus* and *fuscatus* in the same genus as *sinicus*, *irus*, *rhesus*, and *nemestrinus*; and it must be admitted as probable that other species will be found agreeing with the first two in the particulars connected with the penis described by Anderson and Murie. For these two forms the name *Lyssodes*, Gistel, of which *speciosus* is the type, is available. Moreover, the structure of the *glans penis* is a useful character for eliminating *sinicus* from the last three. For *sinicus*, *Zati*, Reichenbach, appears to be the correct title, but, pending the discovery of satisfactory evidence that

M. inuus differs generically from *irus*, *rhesus*, and *nemestrinus*, I provisionally, and quite without prejudice, retain the name *Macaca* for those forms.

By the structure of the *glans penis*, then, the genera of macaques above discussed may be distinguished as follows:—

a. Penis with the glans very long and tapering, and strengthened by a baculum of corresponding length; the urethral orifice interior, in the middle line beneath the apex of the baculum ..... Genus *Lyssodes*.

a'. Penis with the glans short, rounded, subovate or piriform, supported by a short baculum; the urethral orifice a vertical terminal slit, slightly eccentric and opening to the right of the apex of the baculum.

b. Posterior border of upper surface of glans forming a transverse crescentically curved thickening, without median notch ..... Genus *Zati*.

b'. Posterior border of upper surface of glans unthickened, but mesially notched ..... Genus *Macaca*.

The glans penis of *M. inuus*, the type of the genus *Macaca*, is of the kind stated above under that heading. This was long ago pointed out by Daubenton (see Buffon and Daubenton, Mammifères, v. p. 95, 1830; Planches, iv. pl. ccccxv. fig. 1, 1833), who described some points in the anatomy of that species, which he called "le Magot."

A fact of interest to be noted is that whereas the adult males of *Macaca irus* and *Zati sinicus* are not very unequal in size, there is an enormous difference in the relative size of the penis.

XXIX.—*A new Species of* Bassaricyon.

By R. I. Pocock, F.R.S.

The following species of the rare genus *Bassaricyon* have been described, their arrangement, in accordance with their distribution from north to south, being as follows:—

B. richardsoni, Allen, Bull. Amer. Mus. Nat. Hist. xxiv. pp. 662–668, figs. 5, 7, 9, 11 (1908).
From Rio Grande, Nicaragua.

B. gabbi, Allen, Proc. Acad. Nat. Sci. Philad. 1876, pp. 20–23, pl. i.; id. Bull. Amer. Mus. Nat. Hist. xxiv. pp. 662–668, figs. 6, 8, 10, 12 (1908).
From Talamanca and Chiriqui in Costa Rica.